

**METHODS WITH RESOLUTION ENHANCEMENT FEATURE FOR
IMPROVING ACCURACY OF CONVERSION OF REQUIRED CHEMICAL
MECHANICAL POLISHING PRESSURE TO FORCE TO BE APPLIED BY
5 POLISHING HEAD TO WAFER**

ABSTRACT OF THE DISCLOSURE

CMP methods in which a polishing pad is moved relative to a wafer and a retainer
ring implement instructions for applying required pressure to the wafer for CMP
10 operations. Accuracy of computations of the pressures, and of conversion of the pressure
to force, is improved without use of high resolution components, such as high resolution
digital devices. Such improved accuracy is achieved using both digital and analog
operations, and by converting values of required pressure or force from one set of units to
a second set of units and then back to the first set of units. A quantization process is
15 performed using data processed by average resolution digital devices. The process
transfers both pressure/force scale and pressure/force set point data between separate
processors to obtain computed values of pressure and force having acceptable accuracy,
such that quantization errors are eliminated or significantly reduced.